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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,043	08/10/2006	Hideki Oki	S1459.70129US00	4064

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WOLF GREENFIELD & SACKS, P.C.
600 ATLANTIC AVENUE
BOSTON, MA 02210-2206

EXAMINER	
BEST, ZACHARY P	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
08/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,043	OKI ET AL.	
	Examiner	Art Unit	
	Zachary Best	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

ELECTROCHEMICAL DEVICE AND ELECTRODE

Examiner: Z. Best S.N. 10/589,043 Art Unit: 1795 August 14, 2008

DETAILED ACTION

1. Applicant's amendment filed on June 20, 2008 was received. Claims 1-4 and 6-9 were amended. Claims 10-20 were newly added.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

4. The objection to Claim 6 is withdrawn because Claim 6 has been amended.

Claim Rejections - 35 USC § 102

5. The claim rejections under 35 U.S.C. 102(b) of Claims 1-3 and 5-9 as being anticipated by Hoffman et al. are withdrawn because the independent Claim 1 has been amended.

Claim Rejections - 35 USC § 103

6. The claim rejections under 35 U.S.C. 103(a) on Claim 4 as being obvious over Hoffman et al. in view of Isenberg are withdrawn because the independent Claim 1 has been amended.

7. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. (US 4,894,302) in view of Mayes et al. (US 2002/0048706 A1).

Regarding Claim 1, Hoffman et al. teach an electrochemical device, which comprises a first pole (3), a second pole (2), and an ionic conductor (4), wherein said first pole containing an active material comprising Ru or Co (col. 5, lines 61-65, Group 8), and said ionic conductor containing Mg, Al, or Ca (Hoffman et al. claims 1-2). However, Hoffman et al. fail to teach said active material has an average particle diameter as small as 1 nanometer.

Mayes et al. teach an electrochemical cell comprising an electrochemical reaction wherein an ion conductive species is intercalated into a host material during the electrochemical reaction (par. 7), wherein the ion host particles preferably less than 10 nm in diameter because the use of finer particles minimizes the detrimental effects of volume change occurring naturally during the intercalation of the ion conductive species (par. 106). Mayes et al. further suggest the ion conductive species may be calcium or magnesium ions (par. 103). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the active material of Hoffman et al. have an

average particle diameter as small as 1 nm Mayes et al. teach that smaller particle sizes in electrochemical cells where intercalation occurs minimize the detrimental effects of volume change of the host material. Discovery of an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272 (CCPA 1980).

Regarding Claim 2, Hoffman et al. teach the electrochemical device of the first pole is managenese oxide or cobalt oxide (col. 5, lines 65-68).

Regarding Claim 3, Hoffman et al. teach said cobalt oxide (Co_3O_4), which has a ratio of M/X of 0.75.

Regarding Claim 4, Mayes et al. teach the active material particle size is about 30 nm or preferably smaller than 10 nm (par. 106).

Regarding Claim 5, Hoffman et al. teach the first pole is formed from the active material mixed with a conductive material and a polymeric binder (col. 6, lines 3-14).

Regarding Claim 6, Hoffman et al. teach said ions from the ionic conductor are Mg, Al, or Ca (Hoffman et al. claims 1-2).

Regarding Claim 7, Hoffman et al. teach said second pole contains magnesium or calcium (Hoffman et al. claim 2).

Regarding Claim 8, Hoffman et al. teach said ionic conductor is an electrolytic solution (Hoffman et al. abstract) or suggest a solid electrolyte (col. 2, lines 59-62).

Regarding Claim 9, Hoffman et al. teach said electrochemical device is a secondary battery (rechargeable, col. 1, lines 37-39).

Regarding Claim 10, Hoffman et al. teach an electrochemical device, which comprises a first pole (3), a second pole (2), and an ionic conductor (4), wherein said first pole containing an active material comprises managenese oxide or cobalt oxide (col. 5, lines 61-68, Group 8), and said ionic conductor containing Mg, Al, or Ca (Hoffman et al. claims 1-2). However, Hoffman et al. fail to teach said active material has an average particle diameter as small as 1 nanometer.

Mayes et al. teach an electrochemical cell comprising an electrochemical reaction wherein an ion conductive species is intercalated into a host material during the electrochemical reaction (par. 7), wherein the ion host particles preferably less than 10 nm in diameter because the use of finer particles minimizes the detrimental effects of volume change occuring naturally during the intercalation of the ion conductive species (par. 106). Mayes et al. further suggest the ion conductive species may be calcium or magnesium ions (par. 103). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the active material of Hoffman et al. have an average particle diameter as small as 1 nm because Mayes et al. teach that smaller particle sizes in electrochemical cells where intercalation occurs minimize the detrimental effects of volume change of the host material. Discovery of an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272 (CCPA 1980).

Regarding Claim 11, Hoffman et al. suggest that the active material is a mixture of a plurality of compounds ("at least one"), each of the plurality of compounds being represented by the general formula MX (col. 5, lines 61-68).

Regarding Claims 12-13, Hoffman et al. teaches the intercalation occurs to a degree of a maximum characteristic for each host structure, and beyond said degree the crystal structure will change, which is detrimental to the material (col. 7, lines 9-21). It is reasoned that if the crystal structure remains unchanged the crystal state will also remain unchanged because a change in crystal state would inherently change the crystal structure.

Regarding Claims 14-15, Hoffman et al. teach said active material is manganese oxide (Mn_2O_3), which has a ratio of M/X of 0.66.

Regarding Claims 16-17, Mayes et al. teach the active material particle size is about 30 nm or preferably smaller than 10 nm (par. 106).

Regarding Claim 18, Hoffman et al. teach said ions from the ionic conductor are Mg, Al, or Ca (Hoffman et al. claims 1-2).

Regarding Claim 19, Hoffman et al. teach said second pole contains magnesium or calcium (Hoffman et al. claim 2).

Regarding Claim 20, Hoffman et al. teach the first pole is formed from the active material mixed with a conductive material and a polymeric binder (col. 6, lines 3-14).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

zpb

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795